

CHILD SURVIVAL IN INDONESIA

A.I.D. IMPACT EVALUATION REPORT NO. 75
(Document Order No. PN-AAX-238)

by

Phyllis Dichter, Team Leader
(Office of Sahel/West Africa, Bureau for Africa, A.I.D.)

Michael White
(Office of Health, USAID/Haiti)

Pamela Johnson
(Office of Health, Bureau for Science and Technology, A.I.D.)

Diana Altman, Health Consultant
(The Pragma Corporation)

Gary Hansen, Topic Coordinator, Child Survival Evaluation Series
(Center for Development Information and Evaluation)

Agency for International Development

May 1990

The views and interpretations expressed in this report are those of the authors and should not be attributed to the Agency for International Development.

TABLE OF CONTENTS

Preface

Summary

1. Country Setting

- 1.1 Population
- 1.2 Economy
- 1.3 Health Status

2. Indonesia's Child Survival Program

- 2.1 Overview
- 2.2 A.I.D.'s Role and Contribution to Child Survival

3. Program Results and Impacts

3.1 Impacts on Services for Mothers and Children

3.1.1 Family Planning

3.1.2 Nutrition

3.1.3 Expanded Program on Immunization

3.1.4 Diarrheal Disease Control

3.2 Impacts on the Health System

3.3 Impact on Efficiency of Health Services

3.4 Impacts on Infant and Child Mortality

3.4.1 Immunization and Diarrheal Disease Control

3.4.2 Expansion of Family Planning

3.4.3 Other Factors Influencing Child Survival

4. Looking Forward

4.1 Sustainability of Child Survival Activities

4.1.1 Political Will

4.1.2 Adequacy of Resources

4.1.3 Demand for Services

4.2 New Horizons for Child Survival Activities

5. Lessons Learned From the Indonesia Child Survival Program

6. Recommendations and Conclusion

Appendix

Glossary

Bibliography

PREFACE

Five years ago, the Agency for International Development (A.I.D.) greatly expanded its program of child survival activities around the world. Since that time more than \$600 million have been committed to these efforts. As part of a review of this program, the Center for Development Information and Evaluation (CDIE) is undertaking a series of evaluations to provide A.I.D.'s policymakers and senior managers with information on the impact of the Agency's child survival programs.

As part of this evaluation series, we, a four-person evaluation team, spent 3 weeks studying the impact of child survival programs in Indonesia, a country where half the population is under age 20 and life expectancy is 53 years. The purpose of the evaluation is to assess the impact of A.I.D.'s child survival activities on (1) reducing infant and child mortality in Indonesia and (2) strengthening the Indonesian primary health care system. The intended audience of the report is A.I.D. policymakers and managers. However, we hope that the observations will also prove useful to Indonesian colleagues and to colleagues in other agencies. Our chief concern is that child survival programs still in a nascent stage of development or grappling with problems of sustainability and rapid change are able to learn from the

Indonesian experience.

A few methodological comments are in order. First the child survival program, since it is not identified by a separate project, was defined as USAID/Indonesia and the Government of Indonesia view it -- that is, consisting of four primary activities: Expanded Program on Immunization, Control of Diarrheal Disease Program, nutrition (growth monitoring, vitamin A supplementation, and nutrition education), and maternal/child welfare (reducing high-risk births). We also considered family planning in Indonesia. The Government of Indonesia includes family planning in its child survival program, and A.I.D. has provided sustained support for it, although the Agency considers family planning to be a complementary to but not an integral part of its child survival program.

Second, child survival programs in Indonesia are funded by a variety of donors. We concentrated on a review of child survival activities supported by A.I.D., even if some aspects of these activities are funded by other donors. For example, when examining the immunization program, we did not attempt to isolate A.I.D.-funded inputs but looked at the total program.

In addition, because of time constraints, the broad scope of the child survival program, and Indonesia's geography, it was impossible to collect original data beyond what emerged from interviews with key people. We relied, therefore, on the extensive documentation provided by the Government of Indonesia, A.I.D., other donors, and nongovernmental organizations. Of Indonesia's more than 13,000 islands, we selected three to visit: Java, the most populous island, where we visited the capital city of Jakarta and the province of West Java and Nusa Tenggara Timor and Lombok, two islands that rank among the highest in infant mortality. We visited some, but by no means all, of the 26 A.I.D.-funded health sector projects that can be considered directly related to child survival.

If the task was arduous, it was also fascinating. Each member of the evaluation team was enriched by the experience. There are too many people to thank to do justice to all. But we would like to include a special note of appreciation for just a few people: Joy Pollock, who could not have been kinder, more generous with her time, nor more helpful; Dr. R. Soebekti and Dr. Firman Lubis for their help in Jakarta; Dr. Terry Louis of the Academy for Educational Development and Dr. Lukman for organizing our trips in West Java; Dr. Lukas Gunawan for introducing us to Timor; and Maury Milloff of CARE and Brad Otto of PATH for showing us Lombok. We also want to highlight the receptivity and generosity of the Indonesian Government officials in Jakarta and the provinces of West Java and Lombok who organized meetings and briefings, often on short notice. And, we would like to express our appreciation to Farah Ebrahimi, Molly Mort, and Pat Rogers for assistance in preparing the final manuscript. Finally, to the Office of Population and Health -- especially Dr. Emmanuel Voulgaropoulos, John Rogosch, and Joy Riggs-Perla, thanks are due not just for the support they provided but, more important, for making us proud of the work A.I.D. does.

SUMMARY

The child survival program in Indonesia has had a positive impact on the health of children and appears to be reducing infant and child mortality. Furthermore, the program has strengthened Indonesia's primary health care system. There has been a synergistic relationship between progress in delivering key interventions and the rapid expansion of services outside the physical and administrative confines of the existing public health facilities. The most noteworthy achievements of the program have been:

- A rapid expansion of community-level health posts -- called posyandus -- which deliver child survival interventions nationwide
- High rates of immunization of children with diphtheria, pertussis, and tetanus (DPT3), with coverage exceeding 65 percent of children, and measles vaccination coverage exceeding 50 percent
- A diarrheal disease control program that has successfully educated mothers in the use of oral rehydration therapy such that, according to results of a survey of 10 provinces, 40 percent of diarrheal episodes are treated with oral rehydration therapy
- Nationwide expansion of a growth monitoring and nutrition education program through the posyandus

Furthermore, these accomplishments built on and reinforced a nationwide family planning effort that has resulted in 48 percent of currently married women using contraception and has contributed to a declining fertility rate.

Infant and child mortality rates are falling rapidly in Indonesia as the result of a number of factors, including the expansion of health and family planning services and an increasing level of education and economic progress, especially rice self-sufficiency.

Much of the success of Indonesia's program can be traced to the incremental growth of highly focused and vertical efforts to deliver key services. During the 1970s, family planning and nutrition were Indonesia's most broadly delivered health-related programs; they were the "twin engines" that were coupled to reach into communities. Immunization and diarrheal disease control were later added to these programs. In 1985, large-scale efforts began to integrate these services at the community level through monthly community-supported posyandus. As a result, coverage on the community level of all of the interventions has increased.

A.I.D. has played a critical role in stimulating and helping to shape Indonesia's child survival program. Over the last decade A.I.D. provided more than \$60 million in funds (not including support for family planning) and supported more than 25 bilateral, private voluntary organization, and central projects (see Appendix, Table A-1 for an overview of A.I.D. child survival programs in Indonesia). The following factors have been key in A.I.D.'s contribution to the success of the program:

- Sustained commitment and support for highly focused programs (e.g., 21 years for family planning, 10 years for immunization)
- An effective policy dialogue based on long-term relationships and targeted research and studies
- A willingness to support some operational costs of key efforts, especially for innovative activities
- Central programs that have supplemented bilateral resources and have provided support for technical assistance, research, and innovative activities
- Collaboration with other donors and nongovernmental organizations
- Investment in training and education

The evaluation team drew a number of lessons from the Indonesian experience:

- Child survival services can have an effect on reducing infant and child mortality rates. However, it is difficult to attribute specific gains to specific interventions.
- Focusing on a limited number of interventions can rapidly expand services, although services need to be integrated at some point. A country-specific strategy that goes beyond fixed government health facilities is essential. In Indonesia, the posyandu was the key to rapid expansion.
- Child survival programs can expand and improve primary health care systems, particularly by increasing efficiencies and equity in the system. With an appropriate strategy, this can take place even during periods of economic constraints.
- One-time achievement of quantitative targets does not represent sustainable results. Consolidation of political and popular demand at all levels is essential to ensure the long-term sustainability of the program.

Although excellent progress has been achieved overall, the success and sustainability of the child survival program that A.I.D. has fostered in Indonesia are not yet assured. There is additional work to be done to ensure the long-term financial basis of the program, but even more to consolidate program efforts and solidify political support and popular demand.

With its growing working and urban populations, Indonesia faces the first signs of an epidemiologic transition that will affect the types of health care services needed by the population in the decades ahead. Similar challenges of changing health conditions will face many other A.I.D.-assisted countries over the next 10 to 30 years. The evaluation team concluded that it was important to continue support for the child survival program in Indonesia in order (1) to realize and sustain the

benefits of investments made to date and (2) to continue to develop the basis for developing and sustaining creative, efficient, and equitable approaches to meeting the health needs not only of Indonesia's children, but of the nation.

Map of Indonesia available on microfiche.

1. COUNTRY SETTING

1.1 Population

With a population of over 175 million, Indonesia is the fifth most populous nation in the world. It spans a vast territory of more than 3,000 miles across and nearly 1,000 miles north to south, with more than 13,600 islands, about half of which are inhabited. The four islands of Java, Sumatra, Kalimantan (Borneo), and Sulawesi (Celebes), and the western half of New Guinea or Irian Jaya constitute the country's large land masses; the rest of the archipelago includes medium to small islands, some of which are isolated by wide stretches of open seas. The climate and topographical variations of this equatorial area have influenced the varied traditional lifestyles of the more than 300 different ethnic groups.

Indonesia was settled by Malays, Indians, Chinese, Arabs, Micronesians, and Melanesians, but the predominant groups in Indonesia today are the Javanese and Sumatrans, principally of Malay stock. Such groups as Dayak seafarers, Balinese, and New Guineans form small and more traditional ethnic pockets, and a small Chinese community exercises influence as merchants and businessmen. The diversity in people is reflected in religion: 85 percent of Indonesia's population is Moslem -- a group larger than the Moslem populations of Iran, Iraq, and Egypt combined; but Hindus, Buddhists, Christians, Confucians, and animists also reside there. In short, Indonesia is a kaleidoscope of people whose brilliant variety of lifestyles is reflected in their clothing, architecture, and art forms.

1.2 Economy

Indonesia is potentially the wealthiest country in Southeast Asia because of its large and diversified natural resource base. It is the world's tenth-largest oil producer and largest exporter of natural gas; it has vast timber reserves and gold and tin mines; and it grows and exports coffee and rubber.

Since 1965, Indonesia has experienced rapid development and economic transition. "By 1985, Indonesia had doubled its rice production to achieve a fragile self-sufficiency in rice [the staple food], cut its total fertility rate by 31 percent, reduced its population growth to almost 2 percent, and nearly attained universal primary education" (USAID/Indonesia 1988). However, serious reductions in Government revenues due to the mid-1980s oil crisis threaten this economic progress.

Although per capita income grew at almost 5 percent annually between 1965 and 1985, it was still only \$450 in 1989, the lowest among the six nations of the Association of South East Asian Nations (ASEAN [Brunei, Indonesia, Malaysia, Philippines, Singapore, and Thailand]). More than 40 percent of the population still has a standard of living below the World Bank's defined level of poverty. Unemployment looms as a potential threat to economic and political stability because 20 million people will reach working age in the 1990s. Past gains and future prognoses for health and child survival must be assessed in the context of this changing economic setting.

1.3 Health Status

Between 1970 and 1987, mortality of Indonesian children under 5 years of age declined approximately 30 to 40 percent. Similarly, infant mortality declined from 125 to 135 deaths per 1,000 live births in 1970 to approximately 70 deaths per 1,000 live births in 1987. Despite this remarkable progress, Indonesia's infant mortality rate still ranks well above that of its Asian neighbors (see Table 1). Nationwide, nearly one-half million infants die every year.

Indonesia's emerging and increasingly vocal middle class is experiencing the health problems associated with longer life and changing lifestyles. However, for most Indonesians today, infectious and parasitic diseases are still the greatest causes of mortality and morbidity. Access to safe drinking water and basic sanitation is problematic in many areas. Among regions and urban and rural areas there are striking differences in the mortality rates and in the rates of their decline. Thus, in 1985, despite progress nationally, 16 of Indonesia's 27 provinces, representing nearly 70 percent of the total population, still had infant mortality rates greater than 70 deaths for every 1,000 live births.

2. INDONESIA'S CHILD SURVIVAL PROGRAM

2.1 Overview

The Government of Indonesia has made child survival one of its top priorities in health, and the Agency for International Development (A.I.D.) is one of many donors actively supporting programs in this sector. Other major donors are the World Bank, the United Nations Children's Fund (UNICEF), the World Health Organization (WHO), the Asian Development Bank, Japan, and other bilateral donors. In addition, organizations such as the Ford Foundation, Helen Keller International, CARE, and Save the Children, not to mention indigenous private voluntary organizations (PVOs), have also supported activities directly related to child survival.

Interventions to improve the health of children are an important part of Indonesia's development policies. The current Five-Year Plan cites several reasons: the impact of the health of children on their future productivity, the high proportion of total mortality attributable to

mortality of children under age 5 years and its contribution to low life expectancy, and the contribution that reduced mortality makes to the preference for smaller family sizes.

Today, the major thrust of Indonesia's child survival program is the delivery, on the community level, of five principal interventions to mothers and children: nutrition, maternal health, immunization, family planning, and diarrheal disease control. Supported by both Government and community resources, these interventions have historically been delivered through several separate vertical programs. Since 1985, it has been the national policy to integrate the delivery of these services on the community level through organizing a monthly community health post known as posyandu. Village volunteers known as kaders are responsible for organizing the event at a site provided by the community, weighing children, providing nutritional counseling, and keeping most of the records. Government health workers, usually vaccinators, midwives, or nurses, travel from the health center to provide immunizations and to identify high-risk mothers.

Family planning, implemented by the National Family Planning Coordination Board, an independent organization, has enjoyed exceptional commitment from President Soeharto since its inception in 1970. It was developed as a highly vertical program with national direction and an organization that reached down to the village level through volunteer committees and a large number of paid field workers. Service delivery is provided by Ministry of Health and Ministry of Home Affairs staff and facilities.

Table 1. Infant Mortality Rates and Gross National Product
Per Capita in Selected Asian Countries, 1987

Country	Infant Mortality Rate	GNP Per Capita
	no. of deaths per 1,000 live births	dollars
Singapore	9	7,940
Malaysia	24	1,810
China	32	290
Sri Lanka	33	400
Thailand	39	850
Philippines	45	590
Indonesia	71	450
India	99	300
Pakistan	109	350
Bangladesh	119	160
Nepal	128	160

Source: World Bank, 1989

A presidential proclamation in 1974 established a Family Nutrition Improvement Program as an intersectoral effort of the Ministries of Health, Agriculture, and Religious Affairs. The nutrition program was integrated in 1979 with the much better institutionalized family planning program; the combined program offered nutrition and family planning information, oral rehydration therapy, weighing, and other services to mothers and to children under age 5 years.

The national immunization program officially began in 1977, although it built on Indonesia's earlier success and experience with smallpox eradication. The program was administered by the Department of Communicable Disease Control of the Ministry of Health. Initially, only tuberculosis and the combined diphtheria, pertussis, and tetanus (DPT3) vaccines were offered to children under age 5 years. Measles vaccination was added in 1982. Immunization of women with tetanus toxoid vaccine is a more recent emphasis.

Although Indonesia pioneered efforts to promote oral rehydration therapy during the early 1970s, the Control of Diarrheal Diseases Program did not officially begin until 1981. Until 1985, both this program and the immunization program were delivered primarily through fixed Ministry of Health facilities and, in the case of oral rehydration therapy, as part of the nutrition program.

2.2 A.I.D.'s Role and Contribution to Child Survival

A.I.D.'s assistance to child survival in Indonesia is in keeping with Indonesian Government priorities, especially with the goals related to reducing infant and child mortality. Both the Government of Indonesia and USAID/Indonesia have health policy and child survival strategies that emphasize broad application of selected interventions as a key to reducing infant and child mortality and to building a primary health care system. A.I.D.'s bilateral assistance in this arena has been guided by two Mission strategy statements: "A Child Survival Strategy Statement: FY 1987-FY 1990" and "Office of Population and Health Strategic Plan, 1989-1994."

In Indonesia, A.I.D. has worked not only with the Government and many private Indonesian organizations but also with UNICEF, WHO, and other donors, as well as with the U.S. Centers for Disease Control and a variety of PVOs and other institutions. A.I.D.'s bilateral support to child survival has totaled more than \$68 million during the FY 1979 to FY 1989 period. In addition to bilateral agreements, A.I.D. has provided support through Public Law 480. During the last 5 years, A.I.D./Washington has provided at least an additional \$13 million in technical assistance, research, and grants to U.S. PVOs to support child survival programs in Indonesia (see Appendix, Table A-2).

Over the last 10 years, A.I.D. has been the lead donor to the Expanded Program on Immunization (EPI) and, since 1986, on a more modest scale, to the Control of Diarrheal Disease Program. As part of its bilateral program, A.I.D. funded a 10-year project (FY 1980-FY 1990) to provide Indonesia's EPI with long-term advisers from the Centers for Disease Control, other technical assistance, vaccines and other commodities, direct support for some recurrent costs, and support for operations

research and study. A.I.D. collaborated closely with UNICEF and WHO in this program, carrying out joint evaluations and planning exercises.

A.I.D./Washington resources have supplemented bilateral support for EPI, including a grant to UNICEF to involve religious leaders and private Indonesian organizations in immunization activities, and technical assistance from the Resources for Child Health (REACH) project. Because A.I.D. did not have a bilateral project focused on diarrheal disease control in Indonesia, A.I.D.'s support for the Control of Diarrheal Disease Program has been more modest and diffuse, coming largely through A.I.D./Washington projects. For example, using both bilateral and Washington funds, Technologies for Primary Health Care project (PRITECH) has provided the Control of Diarrheal Disease Program with planning, training, and curriculum development; Technologies for Child Health project (HEALTHCOM) has assisted the program with communications; and Applied Diarrheal Disease Research project (ADDR) has helped with applied research in diarrheal disease.

Many other A.I.D.-funded projects have made both large and small contributions to Indonesia's child survival program. For example, through a variety of pilot activities and studies, A.I.D. contributed substantially to the conceptualization and evolution of the posyandu and to the training of volunteer village workers. A.I.D.-funded projects have drawn attention to neonatal tetanus as an important cause of mortality in Indonesia and have helped develop an innovative approach to accelerating tetanus toxoid immunization. U.S. PVOs are working with local government and community groups to extend child survival services to some of the most difficult-to-reach populations in urban slums and remote rural areas. Further, with support from Primary Health Care Operation Research project (PRICOR) and ADDR, A.I.D. helped to establish the Child Survival Center at the University of Indonesia and to strengthen the Center's capacity to conduct and analyze research on child survival.

A.I.D. has reinforced child survival efforts with a number of complementary and supportive initiatives. Most notable has been its long-standing support for family planning. This program has almost certainly had an impact on child survival in Indonesia, both by reducing the numbers of high-risk births and by establishing a tradition of outreach that has served as a model for later child survival initiatives. A.I.D. has also supported efforts to build Indonesia's human and institutional capacity in the health sector, including providing Indonesians with long-term master's-level training in public health at both Indonesian and U.S. public health schools. More than 500 physicians, nurses, demographers, planners, and administrators have benefited from this training. Bilateral projects, through investments (under several projects), have contributed to the development of support systems in personnel training, information systems development, epidemiological capacity strengthening, decentralized planning, and operational research and studies. A.I.D.'s ability to contribute to Indonesia's development in this sector has certainly been enhanced by the Agency's long and close relationship with Indonesia's health and family planning leaders and institutions.

For the future, USAID/Jakarta is planning to consolidate its portfolio and is in the process of designing a new Child Survival in Transition

project (see Figure A-1 in the Appendix). A.I.D. has also initiated a health sector financing project to rationalize the use of public health resources, privatize hospitals, and thus address the financial aspects of sustaining child survival programs. The USAID Mission's strategic statement on the health sector for 1989-1994 emphasizes the financial aspects of the sector. However, it is largely silent on the efforts the Mission intends to make in sustaining the current child survival program with respect to diarrheal disease control and mass communications, donor coordination, and the expected role of PVOs and centrally funded health programs.

3. PROGRAM RESULTS AND IMPACTS

3.1 Impacts on Services for Mothers and Children

Indonesia has made remarkable strides in delivering health services to promote the welfare of mothers and children. Family planning services and nutrition/growth monitoring provided the base for the later expansion of immunization and diarrheal disease control. All four interventions are now reasonably accessible to the majority of the population of this vast country.

3.1.1 Family Planning

At the end of 1987, 48 percent of married women nationwide were using contraception. (Forty-four percent were using modern methods.) On the islands of Java and Bali, where 62.5 percent of the population live, contraceptive use almost doubled between 1976 and 1987 (Government of Indonesia 1989b). The total fertility rate declined steadily from 5.6 live births per woman in 1976 to 3.3 in 1987.

3.1.2 Nutrition

Two major nutrition surveys conducted in 1978 and 1987 show that the percentage of children under age 5 years classified as "severely" or "moderately" malnourished fell from 16 percent to 11 percent (Government of Indonesia-UNICEF 1988). Improved nutritional status has undoubtedly been a principal determinant of mortality declines.

Improvements in nutritional status are due to many factors, including nutrition programs. In addition to supporting the integrated nutrition and family planning program, USAID/Jakarta supported a 4-year program using a multimedia approach to teaching kaders and mothers the principles of improved weaning practices. An end-of-project survey in February 1989 found that both mothers and kaders in the intervention districts of West Java and Lombok had improved their understanding of correct feeding practices, and children in the intervention group had slight but statistically significant improvement in their nutritional status.

The Weaning project, which is part of the Village Family Planning/Maternal Child Welfare project, has supported efforts to promote

better infant feeding practices, such as the use of colostrum, later introduction of supplements, and delayed weaning, especially in urban areas. In several test provinces, the Weaning project was successful in promoting improved breast-feeding practices among mothers delivering in hospitals. The Ministry of Health, using its own resources, is expanding nationwide the use of materials developed in the weaning project.

Vitamin A deficiency is widespread in Indonesia: in 1985, UNICEF estimated that 375,000 children suffered severe deficiencies, and one-third of them would go blind as a result. The original work suggesting a link between vitamin A deficiency and increased infant mortality was done in the Aceh Province of Northern Sumatra. Although this link is not yet accepted in the scientific community, A.I.D., Helen Keller International, and UNICEF are supporting vitamin A activities in Indonesia, including support for the Ministry of Health's vitamin A distribution program and for a detailed study of the impact of vitamin A deficiency on morbidity in children in the Yogyakarta area. An estimated 30 percent of children are reached by efforts to distribute vitamin A capsules. Plans to increase coverage rapidly by using vitamin A to fortify monosodium glutamate (MSG) -- which is consumed by virtually every Indonesian -- were recently set back by technical difficulties that should be resolved shortly.

3.1.3 Expanded Program on Immunization

The Expanded Program on Immunization (EPI) has made tremendous progress in terms of vaccination coverage over the past decade. Immunizations for all vaccines have increased, with DPT1, Polio 1, and BCG achieving or exceeding 75 percent coverage for the first time. As shown in Figure 1, measles coverage has soared from minimal levels in the early 1980s to more than 50 percent by 1988. In addition, a dramatic reduction in drop-out rates for EPI has greatly improved the immunization coverage of serial vaccines. For instance, coverage of DPT3 increased from approximately 6 percent in 1984 to more than 60 percent in 1988 and coverage of Polio 3 increased from 7 percent to almost 62 percent during the same time period. Due to the dramatic improvements in Polio coverage, the Ministry of Health, in collaboration with A.I.D., UNICEF, and WHO, has set a goal for eradicating poliomyelitis in the entire country by the turn of the century. This goal seems attainable in light of the most recent data, which show that Polio 3 coverage in Indonesia reached 73 percent in 1989 (WHO Annual Report 1990).

In spite of its importance as a cause of infant mortality, neonatal tetanus is not yet being adequately addressed by the national program. Research sponsored by USAID/Jakarta through the Comprehensive Health Improvement Program -- Province Specific (CHIPPS) demonstrated that, by 4-month recall, rates of neonatal tetanus deaths were estimated at 10.1 per 1,000 live births in Nusa Tenggara Timur province and 27.5 per 1,000 live births in Aceh province (Thomson 1982). Coverage of pregnant women with two doses of tetanus toxoid vaccine is growing and now reaches approximately 30 percent of all pregnant women and some 60 percent of those who are attending antenatal clinics.

Building on a decade of training efforts, Indonesia now has a strong

foundation to provide proper and safe immunization practices and procedures. A few examples of EPI's widespread efforts, reported in 1988 alone, include the training of over 1,700 health staff and 1,200 doctors in EPI procedures, the production of a third edition of the Implementation Guide for the Immunization Program and the Immunization Newsletter (EPI-D), and the training of over 2,000 staff in the introduction of EPI steam sterilizers in eight provinces (Jones and Emmet 1989).

Figure 1. Immunization Coverage, 1981-1988

An essential element of EPI programs is to ensure that vaccines are kept at appropriate temperatures from the central to the peripheral levels so that vaccines remain potent (this is referred to as the "cold chain"). One of the major accomplishments of Indonesia's EPI has been the development of sufficient manpower and cold chain support such that currently more than 80 percent of all immunizations are administered to children in their villages through posyandus.

Operational research to explore potential program improvements and new areas of interventions also plays an important role in EPI. A few examples of ongoing studies in Indonesia include a cost analysis study for EPI, a study to identify the current status of several nonimmunizable diseases, and a study in four provinces to determine why people miss immunization opportunities and possible solutions to the problem.

A surprising weakness of the immunization program, given the considerable investment in the training of epidemiologists and development of information systems, is that few data are available on which to base estimates of reduced morbidity or mortality associated with vaccine-preventable diseases. A system to monitor morbidity and mortality in selected sites, in Indonesia called local area monitoring, has recently been revised and is now being established on the district level. Local area monitoring is also being conducted in every province using a minimum of five indicators. Results are being compiled and should be available soon.

3.1.4 Diarrheal Disease Control

The Control of Diarrheal Diseases Program, though less mature than EPI, has accomplished much, especially in 3 of Indonesia's 27 provinces selected for intensified program inputs. Although not yet generally available, a recent survey of 10 large provinces (including the three "intensification" provinces), reportedly has found that approximately 25 percent of mothers treated their child's last episode of diarrhea with Oralit, the Indonesian brand name for packaged oral rehydration salts. Another 18.3 percent treated their child with a homemade sugar and salt solution. According to the survey, almost 75 percent of the mothers correctly mixed the Oralit solution, but only 50 percent correctly mixed the sugar and salt solution. If these results reflect the situation nationwide, Indonesia's efforts to promote use of oral rehydration therapy have been remarkably successful in a very short period of time; but the results also raise concerns about the need for

more effective education.

With A.I.D. support, important trials of social marketing approaches to educate mothers, reinforce kader training, and stimulate demand are underway in the three intensification provinces. Special training has been conducted in these provinces for clinical, logistical, trainer, and volunteer management. Diarrhea training units and training centers have also been established in hospitals and health centers in these provinces. One of the provinces, West Java, has eight districts receiving specially pretested training materials (i.e., counseling cards and guide books) and messages from the mass media. The impact of these efforts were to be measured by a survey of knowledge, attitudes and practices in late 1989.

Although there are local producers of Oralit, currently little commercial distribution occurs. Since the Ministry of Health still considers Oralit a medicine, it does not allow the distribution of the solution through the multiple commercial sellers of traditional medicines who reach even the smallest hamlets in the countryside. Marketing research with manufacturers of traditional medicine and promotion of oral rehydration salts through a privately managed family planning promotion activity in Jakarta are two efforts that examine how the commercial sector can play a greater role in the distribution and promotion of oral rehydration therapy in Indonesia.

To encourage physicians to support oral rehydration therapy, USAID/Indonesia is sponsoring an effort to help a distinguished group of Indonesian professors of medicine revise the medical school curriculum to include state-of-the-art materials on diarrhea case management. Once this material, which is nearing completion, is incorporated into the curriculum of the nation's 18 medical schools, newly graduated physicians will be less likely to prescribe costly and largely ineffective intravenous or antibiotic treatment for uncomplicated watery diarrhea.

3.2 Impacts on the Health System

Indonesia has rapidly and dramatically expanded the availability of child survival services at the community level during the last decade, especially during the last 5 years. This accomplishment has been all the more remarkable given the severe budgetary constraints and the tremendous size and diversity of the country. In addition to the increased services discussed above, three types of institutional expansion have occurred:

- Modest investment in the expansion of peripheral facilities and personnel, including a 50-percent increase in health centers (from 3,700 in 1985 to 5,600 in 1988)
- Dramatic expansion of community-supported integrated health posts -- posyandus -- (from 83,000 to 215,000) and community volunteers (from an estimated 500,000 to some 2 million)
- Expansion of other privately financed services, especially in urban areas

The major growth in services has been in the number of posyandus, monthly health posts or events organized by community volunteers, at which health, nutrition, and family planning education and services are provided. A uniquely Indonesian institution, the posyandu must be viewed in the context of the Government's commitment to community involvement and its identification of health as one of 10 priorities for community organization and voluntary activity. The posyandu concept grew out of the integration of several vertical programs: first, the national family planning program's village-level groups of family planning users in the 1970s were integrated with a nutrition program that promoted growth monitoring and nutrition education at monthly "weighing posts." (A.I.D. was instrumental in bringing these two programs together.) After experiments in West Java and elsewhere, the Government added immunization, diarrheal disease control, and prenatal services and in 1985 adopted the posyandu on a national scale.

Volunteers are the core of the posyandu system; the value of their unpaid labor accounts for half of the program's actual and imputed costs. Responsible for organizing the monthly event at a site provided by the community, volunteers -- generally members of the national women's organization -- weigh children under age 5 years, provide nutritional counseling and oral rehydration therapy when needed, and keep most of the records. Government health workers, usually vaccinators, midwives, or nurses, travel from the health center to provide immunization and other services at an estimated cost of about \$250 per year for each site, including costs for supervision and training.

Posyandus have been a major factor in the expansion of immunization coverage over the last 5 years and now provide an estimated 60 percent of infant and child immunizations. Through the posyandus, thousands of villages and hamlets have been linked for the first time to peripheral health facilities. In some communities, trained health personnel now have a greater presence and provide simple curative services through posyandus.

Like any system based on volunteer labor, posyandus face difficulties with turnover, quality of service, and efficiency. This is especially the case for services that are the responsibility of different ministries and organizations. However, several projects, including a number of PVO projects that work closely with posyandus, have demonstrated that, with training and adequate support and supervision from the health system, volunteers can educate mothers effectively and help increase access to and coverage of child survival services. Pilot activities are also showing that volunteers can serve as depot holders for oral rehydration salts and selectively treat or refer children with respiratory illness. The Government of Indonesia, seeking ways to strengthen the posyandus, held a major meeting to review various experiences with posyandus while the present evaluation was taking place. The Ministry of Health has adopted plans to place 18,000 midwives at the village level to work with the subhealth centers and to offer maternal health services on a fee-for-service basis.

In addition to the Government health centers and community-sponsored posyandus, there has been a modest expansion of other private sources of child survival services. With Government of Indonesia encouragement,

PVOs are playing an important role in extending services, especially to remote and even underserved urban populations. Several U.S. PVOs have assisted communities to establish and reinforce posyandu activities, and in some cases, added such activities to improve water supply, improve community-financed control of dengue fever, and establish community health funds.

Private physicians are also beginning to offer immunization and to recommend oral rehydration therapy for diarrhea at approximately the same rate as physicians in public health facilities. The Indonesian Medical Association, the national association of 23,000 physicians, has adopted child survival as a major goal and, with A.I.D. support, is conducting pilot projects to find ways to involve private physicians in the delivery of child survival services. The Government is also experimenting with new ways of encouraging more private service delivery, including a contract provision with private vaccine distributors requiring them to establish fee-for-service immunization clinics in urban areas. It is estimated that approximately 20 percent of vaccinations are currently given by private providers on a fee-for-service basis, primarily in urban areas. However, since virtually all physicians with private practices also work for the Government, the "private sector" per se can be more readily distinguished from the perspective of a consumer than from that of a provider. (Services are generally public in the morning and private in the evening.)

Alongside growth in the delivery of child survival services, Indonesia's capacity to produce and distribute essential supplies, including vaccines and oral rehydration salts, has also increased. A.I.D. contributed to a 25-percent expansion of Indonesia's production line for pertussis vaccine and, in a more modest way, to tetanus toxoid vaccine production. Currently, Indonesia produces all diphtheria, tetanus, and tuberculosis vaccines, and almost all of the pertussis vaccine, for its national needs. However, the significant drop in vaccine production during the 1987 oil crisis showed the vulnerability of the supply to financial pressures and shortfall in Government revenues (see Figure 2). (Donors made up for the 1987 decline with emergency procurement, including one from A.I.D. using Public Law 480 funds.) BioFarma, the national producer of biologicals, anticipates meeting national requirements for measles and polio vaccines by 1993 with a new production facility to be constructed with Japanese assistance.

Given the rapid expansion of these programs during the last 5 years, it would be surprising if implementation were universally effective. Studies supported by A.I.D. and others have identified a number of areas that need greater attention: improving the quality of service, especially at the posyandu level; increasing volunteer training, supervision, and retention; improving communications; improving coordination and training in the diarrheal disease control program; and broadening coverage with tetanus toxoid and measles vaccine.

3.3 Impact on Efficiency of Health Services

Although few data are available on which to base a thorough assessment, there are significant indications that Indonesia is

increasing efficiency within its child survival program by focusing most of its efforts on the major causes of preventable mortality and by integrating services at the community level. A number of steps to promote efficiency are underway or under consideration:

- Increased emphasis on measles and tetanus toxoid immunization
- Pilot projects that may lead to greater use of mass media
- Better targeting of immunization efforts through area-specific planning and attention to decreasing drop-out rates

Figure 2. Growth of Local Vaccine Production 1982-1989

- More efficient and effective approaches to volunteer training

At the same time, there are indications of areas of continuing inefficiency, such as the use of pharmaceuticals. A 1988 A.I.D.-funded study showed that the average child under age 5 years received four drugs per case of diarrhea and that vitamins and minerals were prescribed for diarrhea more often than were oral rehydration salts. The study concluded that current health center expenditures on treatments for diarrheal disease are substantial enough to pay for all necessary treatment if prescribing patterns were improved.

Indonesia's national policies stress increasing the efficiency of resource allocation in terms of equity. Historically, differences among provinces in the distribution of health services and in mortality levels have been significant (see Figure 3). As an indication, provinces such as Yogyakarta and Bali have infant mortality rates several times lower than rates in provinces such as West Nusa Tenggara, East Timor, and Central Sulawesi. National and even provincial-level statistics mask further variations among districts, between urban and rural settings, and among religious and linguistic groups and unsettled populations.

There is good evidence that the establishment of posyandus and the delivery of immunizations are more evenly distributed across the nation than are other health facilities and services. In fact, the most significant early impact of child survival activity in Indonesia, with its emphasis on broad-based delivery of key services, may be on equity. Through such bilateral projects as CHIPPS and grants to PVOs, A.I.D. has directed some of its support at area-specific child survival efforts in provinces with the highest mortality rates. With A.I.D. assistance, Indonesia has developed specific strategies to increase equity. An example is area-specific planning for immunization designed to increase coverage in provinces and districts with lower coverage. Coverage targets, set down to the posyandu level, have stimulated aggressive outreach and thus broader use of services within communities. As a result, as Figure 4 shows, in just 3 years the gap in measles immunization coverage has been reduced from more than a tenfold difference between the provinces with the highest and lowest coverage in 1985 to just over a twofold difference in 1988. Indeed, Indonesia is seeking to achieve its national targets, first in every province and ultimately in each district. Ironically, however, as national targets

are achieved, donor interest has begun to subside and the potential for achieving this broad national participation may not be realized.

Figure 3. Differentials in Infant Mortality by Residence and Province

Figure 4. Growth in Equity: Measles Coverage by Province
1985-1986 and 1988-1989

3.4 Impacts on Infant and Child Mortality

The mortality rates for all children in Indonesia declined rapidly during the 1970s and the 1980s. Discussion among analysts centers not on whether this change has occurred, but rather on how rapidly rates have declined and what is responsible for it. A.I.D. accepts official figures that show a decline in the mortality rate for all children under 5 years of age of about 35 to 40 percent between 1970 and 1987, and an even more dramatic decline in infant mortality of about 45 to 50 percent during the same period. Other analysts agree that rapid decline has occurred, but suggest a somewhat slower rate. Although Indonesia has progressed rapidly, it still lags far behind some of its neighbors (see Table 1).

Most knowledgeable informants with whom the evaluation team talked believed that the combination of increased access to health and family planning services, decreasing levels of poverty, increasing food self-sufficiency, and increasing educational and economic opportunities for women explain most of the mortality declines over the last two decades. However, even with carefully designed studies that differentiate among the multitude of variables known to be associated with mortality declines, it is virtually impossible to reliably attribute a certain percentage of the observed decline to one factor (much less a single project).

3.4.1 Immunization and Diarrheal Disease Control

Studies in localized areas in Indonesia have demonstrated the powerful impact immunization and diarrheal disease control programs can have on reducing mortality. In two districts of Aceh province, 84 percent of target women were given two doses of tetanus toxoid vaccine. Following this campaign the neonatal mortality rate in Aceh declined from 32.1 deaths to 4.9 deaths per 1,000 live births. Similar results have been achieved in West Java.

Hospital admission rates and overall case fatality rates have been found to be good indicators for monitoring the impact of efforts to improve diarrheal case management. An analysis of data from the Jakarta Infectious Disease Hospital shows that case fatality rates from diarrheal diseases fell significantly from 2.4 percent prior to the introduction of oral rehydration therapy in 1980-1981 to 0.7 percent after the introduction of oral rehydration therapy between 1982 and 1985. During both time periods the hospital admission rate significantly

decreased from 25.7 percent to 13.2 percent. These changes may reflect changes in diarrheal management practices in the community and the hospital.

National mortality data are more difficult to obtain and to interpret. Since the dramatic national increases in immunization coverage and oral rehydration therapy use did not take place until after 1985, the conclusion might be that these interventions did not contribute to the mortality declines in the early 1980s. However, provincial-level data show a different picture since child survival programs did not expand evenly to all provinces (as shown in Figure 4 in the case of measles). The data suggest that on the provincial level the expansion of these interventions has been associated with declines in mortality rates. Nine of the 12 provinces with mortality declines greater than the national average between 1970 and 1985 also had greater-than-average coverage with measles and other vaccines. Conversely, 8 of the 14 provinces with lower-than-average rates of mortality decline also had lower-than-average immunization coverage. Cause-of-death data from household surveys in 1980 and 1986 suggest that there was a moderate decline in both tetanus and diarrhea-related deaths among infants during this period (See Table A-3, reanalyzed data, in the Appendix).

Despite the economic reverses and the declining health budgets of the last 5 years, the 1991 Demographic and Health Survey and the upcoming census should document that the impressive declines in infant and child mortality have continued in Indonesia during the late 1980s. It is highly likely that the immunization and diarrheal disease control programs will have contributed prominently to that decline. However, until the data on mortality for that period becomes available, it is impossible to do more than speculate about the specific impact of recent dramatic increases in vaccination coverage and diarrheal disease control on national-level mortality rates during the late 1980s.

3.4.2 Expansion of Family Planning

Data from the 1987 National Indonesia Contraceptive Prevalence Survey demonstrate that births to older or very young women, births to women who have had six or more previous pregnancies, births at intervals of less than 2 years, or births to women with little or no education are much more likely to result in death of the child (see Table 2). Indonesia's highly successful family planning program has targeted and prevented many of these high-risk births over the past two decades. Age-specific fertility rates among these high-risk groups -- that is, ages 15-19 years and over age 40 years -- have shown decreases.

3.4.3 Other Factors Influencing Child Survival

Rice Self-Sufficiency and Decline in Poverty. With increases in rice production, Indonesia currently enjoys a fragile self-sufficiency in rice, the staple food. Food self-sufficiency among rural people not only decreases malnutrition but also allows people to purchase health care with money that would have been spent on food. UNICEF reports that the percentage of rural Indonesians living in poverty declined by almost 50 percent (from 40.1 percent to 21.5 percent) between 1976 and

1984.

Education. There is a high correlation between greater educational attainment on the part of the mother and lower infant mortality. Primary school enrollment for girls in Indonesia increased from 58 percent in 1960 to nearly 100 percent in 1986. Female literacy increased from 42 percent to 65 percent between 1970 and 1985 (interview with UNICEF site representative).

Table 2. Infant and Childhood Mortality by Demographic Characteristics, 1977-1987
(number of deaths per 1,000 children)

Characteristic	Infant Mortality Rate (<1yr.)	Childhood Mortality Rate (1-4yrs.)	Under Age 5 Mortality Rate (<5yrs.)
Sex of Child			
Male	84.2	36.6	117.7
Female	65.6	41.7	104.6
Mother's Age at Delivery			
Less Than 20	99.2	36.8	132.3
20-29	68.1	38.5	104.0
30-39	74.2	41.6	112.8
40-49	71.1	53.1	120.4
Birth Order			
1st	78.1	25.9	102.0
2nd-3rd	70.3	40.3	107.7
4th-6th	70.5	39.2	106.9
7th or greater	94.0	60.8	149.0
Interval Since Previous Birth			
Less than 2 years	109.1	50.6	154.2
2-3 years	62.1	45.7	105.0
4 years or more	50.6	25.6	74.9
Mother's Education			
None	98.8	48.4	142.4
Some primary	82.5	48.5	127.0
Primary completed	60.1	26.2	84.8
Secondary or higher	33.9	9.2	42.8

Note: Includes calendar year 1987 up to the month preceding the date of interview

Source: Government of Indonesia, 1989b.

4. LOOKING FORWARD

4.1 Sustainability of Child Survival Activities

Based on interviews with Indonesian colleagues, the evaluation team reviewed three factors people agreed were essential to the sustainability of programs: political will, adequacy of resources, and community demand. A fourth factor, Indonesia's capacity to deliver health services is discussed in Section 3.

4.1.1 Political Will

The support for child survival activities of the president of Indonesia and a number of governors and other leaders has provided an important stimulus for accelerated immunization and expansion of the posyandus. A poster of President Soeharto giving polio vaccine to a child is prominently displayed at traffic intersections and health facilities nationwide. Similarly, Ministry of Health statements and Government planning documents, such as the Fifth Development Plan, reflect national policy that the health of babies and children under age 5 years still needs primary attention. A declaration of support for child survival activity from the Indonesian Medical Association; the involvement of the women's movement and Rotary clubs and other private voluntary associations; and collaboration with religious leaders on tetanus immunization are encouraging signs. So, too, was the decision in 1988 to put funds for purchasing vaccine in the more secure "President's Budget," rather than in the country's general health budget.

Nevertheless, there are other indications that the long-term political commitment required for a sustained program is not yet solid, either at the national or subnational levels. It is instructive to contrast the level of political commitment for child survival with that for family planning.

In the case of family planning, clear and unequivocal political support has been built over two decades from the level of the presidency down to the grass-roots level in communities. This support has translated into increasing budgetary support, an ability to retain revenues generated on the local level, and a legal and regulatory environment that supports delivery of services by medical and nonmedical personnel. Years of work by the National Family Planning Coordinating Board with community and religious leaders, the national women's organization, various ministries, and other organizations and agencies have paid off in broad commitment. A.I.D.'s role as an unwavering ally has been critical.

The process of building support has begun for child survival, but much greater support is needed to ensure the sustainability of the programs. On the national level, budgetary commitments are not assured. Expenditures for children are small in proportion to children's health problems; while mortality under age 5 years accounts for 44 percent of all mortality, services directed at the almost entirely preventable causes of death in this cohort account for only 10 percent of health expenditures. On the regional and district levels, preventive health activities compete with curative facilities, as well as roads and other community priorities, even to retain revenues generated in health

facilities. Donor support, especially for immunization, has been strong, attracting resources and sustaining political support. However, future donor priorities are not clear, and shifts in priorities and significant declines in support will affect not just the resources for these programs but the political commitment to them as well.

4.1.2 Adequacy of Resources

Indonesia achieved a substantial expansion of health facilities during the oil boom period of the late 1970s and early 1980s. Since 1982, however, direct central spending on health has fallen by 45 percent. In 1985 Government expenditure was about \$3.40 per capita and represented about 2.6 percent of total central Government expenditures.

Understanding how the Government of Indonesia finances health care and what the allocation trends have been is not a simple task. Central and regional governments have at least 10 different budgetary sources that finance the main public health system. This category does not include the Armed Forces or other ministries, departments, and parastatals. Furthermore, there is no comprehensive source of data aggregating these budgets at regional or district levels.

The allocation of central funds has shifted toward recurrent expenditures, which went from 66 percent to 90 percent of the central budget between 1984 and 1988. Salaries absorbed about 35 percent of recurrent spending in 1984 and increased by 32 percent during the next 4 years. Nonpersonnel routine expenditures fell by 22 percent, and investment outlays -- construction and equipment -- were cut by 80 percent. The effort of the fiscal adjustment was to curtail expansion of health service facilities.

The functional allocation of the central Government budget demonstrates another trend; the shift of resources to hospital care (see Table 3). For example, in 1984 the budget specifically directed at communicable disease control was already low at 8 percent of the total health budget; by 1987, it was effectively cut by 62.5 percent (compared with an overall budget cut of 30 percent), while hospital and health center funding increased. The large cutback resulted in virtual elimination of all communicable disease control programs except malaria control, diarrheal disease control, and EPI, with the latter two receiving additional foreign assistance.

The effect of the central Government budget reductions has been to increase the share of the total health budget covered by provincial governments and foreign assistance. Between 1982 and 1986, the central Government provided 70 percent of the funding, provincial governments provided 15 percent, and foreign assistance provided 15 percent. In 1986-1987, the central Government share fell to 50 percent, the provincial government share increased to 18 percent, and foreign assistance increased to 32 percent.

Table 3. Allocation of Central Government Funding for Health
(percentage)

Recipient	1984	1987
Hospitals	32	36
Health Centers	30	31
Communicable Disease Control	8	3
Training	9	8
Other Programs (administration)	21	21

Source: Wasisto, 1977.

In addition, with operational coverage reduced, community health services have had to provide more services with less resources. Operating budgets, including funds for supervision, have been cut. In addition, because of funding reductions the Government was unable to fully realize its targets for expanding health centers and staffing at the periphery during the Fourth Plan (1985-1989).

As was noted above, the posyandus depend on the labor of volunteers, who are almost entirely women, many with older children. Given low levels of employment, the opportunity costs of their labor may not be significant, and increased ease of access to health services and other direct benefits to the volunteers (such as training) may offset costs in terms of the household economy. However, retention of kaders is a problem, and the evaluation team could only speculate that the problem may be greatest in wage-earning urban areas and in the poorest communities, where the opportunity costs for women's work are most significant.

4.1.3 Demand for Services

Lower demand for child survival and other preventive services than for curative services is one of the critical weaknesses of the Indonesian program. A number of people contrasted child survival with family planning, an area in which broad sustained demand is now driving the private sector delivery of services. This weakness in the child survival program, if it remains unaddressed, will only be magnified with increasing decentralization because the demand for curative services will continue to undermine support for preventive services.

Some progress is being made in this area, primarily through the use of one-to-one education and motivation by volunteers. Middle-class families are increasingly seeking and paying for immunization by private physicians, an indication that they understand and value this service. National declines in immunization drop-out rates suggest a growing acceptance of full protection.

Indonesia has not yet realized the full potential of its powerful communications resources in stimulating and sustaining knowledge and demand, especially in immunization and diarrheal disease control. A.I.D. is playing an important role in supporting large-scale pilot efforts that are beginning to demonstrate the potential effectiveness of social marketing. In West Java, which has a population of 27 million, at least 75 percent of all mothers listen to the radio, and 90 percent of

urban and 50 percent of rural mothers watch television. A.I.D. is supporting a pilot program to train kaders as oral rehydration salts depot holders and to use the mass media to teach and motivate mothers to treat diarrhea appropriately and, not incidentally, to reinforce the role and training of the kaders. An evaluation of the pilot program will be completed by early 1990, yielding results that should have important national implications. A.I.D. has also supported innovative activities to stimulate demand for tetanus toxoid immunization including the production of a video for Indonesian television that promotes a new "brides-to-be" tetanus toxoid vaccination effort.

The Fifth National Plan (1989-1994) explicitly addresses the issue of demand for child survival services, providing increased budget for and focus on communications for child survival and other preventive programs. This is a critical time for communications initiatives. Confronted with the challenge of effectively allocating increased communications resources, the Ministry of Health faces a strategic choice between almost exclusive reliance on face-to-face communication through volunteers and more aggressive use of mass media to reinforce kader efforts and to reach families directly.

4.2 New Horizons for Child Survival Activities

Tetanus, measles, and diarrhea remain the most readily preventable causes of infant and child deaths in Indonesia. However, as these diseases are brought more under control further reductions in mortality will require focusing on a new series of problems -- most notably, acute respiratory infection (ARI) and causes of perinatal mortality.

Indonesia's 1986 Household Health Survey suggests that ARI is currently the principal cause of death in children ages 1 to 4 years and is responsible for 40 percent of mortality in this age group (see Table A-3). Since measles contributes to this mortality as both a direct and underlying cause of respiratory infection, there is further reason for the Ministry of Health and the donor community to sustain and expand immunization efforts. In addition, they need to continue to aggressively seek innovative solutions to the management of ARI cases.

Several efforts are underway to find ways to manage ARI cases more effectively. In West Java, kaders are screening and treating mild respiratory infection cases and referring moderate and severe cases to health centers. In Lombok, WHO is supporting a study of an ARI intervention that combines diagnosis and treatment in health centers with improved diagnosis and treatment at the village level by kaders. Forty-five kaders specially trained to distinguish the severity of respiratory infections provide treatment, including antibiotics for mild and moderate cases, and refer severe cases to health centers. The kaders also carry out a census of their villages every 3 months, using a questionnaire known as a "verbal" autopsy to try to establish the cause of any deaths. Preliminary results from this extremely rich data set indicate that mortality has fallen dramatically over the first 2 years of the intervention. The extent to which this decline can be attributed to the ARI intervention, to increased measles vaccine coverage (measles mortality has also fallen dramatically), or to other factors is undetermined at this time.

While success with this approach is encouraging, many public health experts are skeptical that it can be practically implemented on a scale sufficient to have a significant effect on mortality, especially among very young children who die more quickly, often before receiving treatment. The ARI intervention being tested in Lombok, which puts antibiotics in the hands of kaders, also merits attention because problems with antibiotic resistance could emerge if antibiotics are dispensed in massive amounts at the village level.

More than half of perinatal deaths (deaths in the first month of life) are directly due to complications of labor and delivery or to intrauterine growth retardation. Indonesia is committed to assigning a midwife to every village in the country, and significant improvements in antenatal care and supervision of home-based delivery should be possible. Better nutrition counseling and improvement in food consumption by pregnant women, iron and folic acid supplementation, and prophylactic treatment of malaria in areas where malaria remains a serious problem should help reduce the frequency of intrauterine growth retardation and subsequent low-birth-weight infants.

Once other issues have been adequately addressed, USAID/Indonesia may want to consider helping the Ministry of Health with the problem of accidental death in children. The 1986 Household Health Survey indicates that poisoning, drug overdoses, and accidents account for 2.6 percent of mortality in children under 5 years of age. Simple and inexpensive interventions such as legislation mandating child-proof containers for poisons, medicines, and other harmful products could prevent many deaths. These emerging problems must not, however, divert attention from the more important problems of tetanus, measles, and diarrhea and from the opportunity to prevent them.

5. LESSONS LEARNED FROM THE INDONESIA CHILD SURVIVAL PROGRAM

The child survival program in Indonesia offers important lessons for the Indonesians, for other USAID Missions, and for A.I.D. because of the variety of approaches used. The lessons learned can be summarized as follows:

Child survival services can have an effect on reducing the infant and child mortality rates, but it is difficult to attribute specific gains to specific interventions.

It is clear that more children are receiving more services and that morbidity and mortality have almost certainly declined substantially in Indonesia during the last 5 years. However, whether A.I.D.'s child survival activity has been a factor in that decline is a question that we asked a number of people but for which little hard data were available. Provincial-level data suggest a relationship between A.I.D.-supported interventions and declines in child mortality rates; but determining impact on a national level will only be possible with the data from the 1990 census and the 1991 Demographic Health Survey.

Attributing mortality reductions to a single intervention or even multiple interventions is very difficult and requires expensive studies.

Incontestable attributions probably require placebo-controlled, double-blind trials of interventions with known benefits, such as measles vaccination--trials most people would consider unethical. Comparing similar but geographically or otherwise distinct groups raises some questions about uncontrolled variables. Finally, even if seemingly incontestable results are found in one country, would they also be true for another?

The lesson here is that a definitive answer on the mortality reduction effects of various interventions will have to come from a more significant investment in research. But if reasonable causality or plausible association can be assumed from certain technologies or interventions, as is the case for Indonesia, A.I.D. should continue to support expanded coverage. Furthermore, the evaluation team recommends that A.I.D., on an Agencywide basis, invest in rapid-style presentations that successfully portray to policymakers the relationship between child survival services and development. Perhaps if A.I.D. can demonstrate better that reducing infant mortality will lead to reduced costs of social services and increased productivity, the program will have greater political support.

Child survival programs can expand and improve primary health care systems, particularly by increasing efficiencies and increasing equity in the system. Strategy and approach are key to these improvements.

The child survival program appears to have had a strong and positive effect on the primary health care system in Indonesia. More facilities are operating, particularly at the peripheral level. Through the posyandus, services are being delivered at the village and hamlet level. Currently, more private doctors, nurses, and midwives are offering basic services and the Government of Indonesia is starting to encourage greater involvement by the private sector because of a need to make family planning and children's health services more available.

The lessons offered here relate to how governments can solve the dilemma of needing to increase social services during a period of restricted government spending, an issue of particular importance to governments wanting to cushion the effects of structural adjustment on the poor. The Indonesia program demonstrates one approach to maximizing the use of limited resources and increasing equity in the system.

- Expansion of child survival services relied on home-based methods and mobilized community support and labor. While this approach may have increased costs to consumers, particularly in terms of time inputs for volunteers, it required much lower Government expenditures.
- The cost of services was kept low -- \$250 per year for 100 families, or about \$.50 per person.
- Five important interventions administered by different programs and involving at least three ministries were integrated at one service delivery point.
- Operating posyandus out of existing facilities reduced capital

expenditures.

- Central as well as provincial-and district-level governments worked together to distribute costs and responsibilities.
- Using low-skill volunteers and community-based support systems to promote training reduced operating costs.
- Determining which regions suffered from the highest infant mortality rates and targeting resources to those areas resulted in the more equitable distribution of services. The result may be more rapid reductions in infant mortality rates in those areas and therefore a bigger impact nationwide.

The posyandu system needs much work, both to ensure delivery of effective services and to enable sustainability, but investments made to date have supported more efficient use of resources and expansion of at least some primary health care services over a wide area at a very low cost.

A focused approach can be the basis for building an integrated program. The correct approach to building a child survival program begins by introducing focused programs and then developing them into integrated systems. The strategy used to deliver the interventions is critical to success.

Much of the success of Indonesia's child survival program can be traced to a highly focused effort. In the 1970s, family planning and nutrition were Indonesia's most critical programs; they were what the evaluation team termed the "twin engines" that were coupled to pull a train of other efforts: EPI and control of diarrheal disease. These programs enjoyed long, continuous support from the Government of Indonesia and the donor community. They were first built as vertical programs and later integrated with other efforts after they had achieved a certain maturity and some part of their objectives.

In the case of family planning, political commitment was generated throughout the body politic. While acceptance rates were low at the beginning, efforts to convince religious leaders coupled with strong mass media campaigns and community-based distribution were quite successful. Thus, one lesson is that focusing initially on sequential implementation of effective, relatively low-cost technologies is a good strategy when it is later followed by integration.

The following factors seem to have been critical to selecting successful interventions with which to build an integrated program:

- A high level of existing or potential political support.
- Service delivery that was not confined to Government facilities but rather made use of the broadest possible network.
- Community-or population-based, not facility-based, interventions.
- Attention to creating community demand for priority preventive

services.

- The use of simple and effective technologies.

Specific strategies need to be country specific.

In Indonesia, community participation and voluntary efforts have been successful, although such an approach may not be viable in countries that do not have such a strong tradition of community organization. Indeed, even in Indonesia, sustaining volunteer efforts over the long run may be a real challenge.

One-time achievement of A.I.D.'s quantitative targets does not necessarily represent establishment of a sustainable system.

A.I.D. has established three quantifiable targets for measuring the effectiveness of its child survival program:

- Reduction of the infant mortality rate to less than 70 deaths per 1,000 live births
- Immunization coverage of 80 percent of children by their first birthday.
- A 95-percent access to and 45-percent usage of oral rehydration therapy

Indonesia is rapidly approaching these targets. Does that mean it has a sustainable program, one that no longer requires donor assistance? The program has many of the elements of sustainability: its approach was designed by the Government of Indonesia; its structure is aimed at integration of services; it builds upon Governmentwide objectives, not just in the health sector but in its core political philosophy; and support has continued despite budget cuts.

Ultimately, sustainability will depend on broad political support: how much political support the program has and therefore what share of the public resources it will receive; how much demand there is for services and therefore how much consumers will pay. Increasing and consolidating demand for preventive services is the next major step for the program designers, and increasing political will is the next step for the policymakers. In the Indonesia program today, the best signs of increasing political support come primarily from the joint efforts of the Ministries of Health and Home Affairs and the National Family Planning Coordinating Board to redefine their roles and strengthen the posyandus. A strengthened posyandu system offers great potential for increasing demand as well, if the following are accomplished:

- Quality of services must be such that people actually get what they pay for, at least in terms of time spent. To achieve this level of quality requires investments in human capital, particularly in attracting and training volunteer organizers and professional service deliverers. It will also require consistent supervision and retraining when necessary.

- A communication strategy must be devised and more social marketing done to motivate communities and their leaders through developing their understanding of the relationship between children's health and the preventive services offered.
- Incentives have to be devised to motivate volunteers to maintain or improve their skills and to keep the community motivated.
- The paradox of how to offer preventive services to a population that also needs curative services must be resolved, particularly for rural communities where the only source of health care may be a posyandu. Indonesia plans to encourage midwives by offering a sort of franchise arrangement -- they will work in villages, organizing posyandus as volunteers, but will also provide services for a fee.

The other major factors of sustainability depend on how well decentralization is accomplished, since so much of the child survival program depends on regional and district government budgets and community support, and on whether the private sector is encouraged to fully participate.

6. RECOMMENDATIONS AND CONCLUSION

Building on its success and relationships, A.I.D. has a major opportunity in Indonesia. There is little question that Indonesia is facing the first signs of an epidemiologic transition that will affect the types of health care services needed by the population in the decades ahead. How A.I.D. helps Indonesia in this transition will have a major impact on the country's future health status. Similar challenges will face most A.I.D.-assisted countries in the coming decades, and it is incumbent upon A.I.D. to plan for it.

USAID/Jakarta has begun planning for this future by focusing on finances in an effort to reverse the flow of resources from child survival and other public health programs to hospitals. The evaluation team strongly recommends at least as great a focus on consolidating elements of the child survival program that have a lasting effect on the health and lives of children and that could provide Indonesia with a strong base for addressing future health needs. The potential is there to create:

- A strong political and public commitment to cost-effective allocation of health resources
- Community-level service points -- public and private -- that are sustainable and responsive to communities' needs for simple curative services, such as oral rehydration therapy and treatment of ARI, as well as for preventive techniques
- An effective communications capability developed around child health that can be applied to future health problems

- A meaningful mobilization of the private sector to achieve public health goals
- An immunization program that first achieves and then sustains broad coverage of current vaccines (especially measles and tetanus toxoid) and thus, in the future, is able to incorporate new vaccines (e.g., hepatitis B) addressing other causes of morbidity and mortality in adults as well as in children
- A capacity to assess health problems and programs and establish priorities for the allocation of public funds

The evaluation team concluded that the needs of the children of Indonesia are not in conflict with the needs of Indonesia. Rather, meeting children's health needs can serve, as they have served over the last 5 years, as the basis for developing and sustaining creative, efficient, and equitable approaches to meeting the health needs of the nation.

While the evaluation team agrees with the USAID Mission that Indonesia is facing a major demographic transition -- one that will affect the types of health care services needed by the population -- it believes the significance of that transition for today is the unique opportunity being provided. If the child survival program is continued and used to build a primary health care system, the stage will be set to respond to future health challenges as well. Our recommendation to the USAID Mission is to continue to reinforce the system through the child survival program.

APPENDIX

Table A-1. Child Survival in Indonesia: An Overview

Program Element:

1. Control of Diarrheal Diseases, 1981 {a}:

A.I.D. Support: 60+million Progress: 215,000 commu- Impact: Increased
family planning. program interventions services.
 nationwide.

Lessons Learned: Next Steps: Sustain
Child survival programs investments to date
can reduce infant and in child survival
child mortality but programs.
attribution is difficult.

Program Element:

2. Expanded Program of Immunization, 1977 {a}

A.I.D. Support: 25 Progress: High rates Impact: More
bilateral, private of immunization of equitable distri-

and A.I.D./Washington projects. children: bution of health services, (e.g.,

BCG (tuberculosis): 74% 500% reduction
Polio 3: 62% of vaccination
DPT 3: 61% gap between high
Measles: 55% and low service
Tetanus Toxoid: 29% areas.)

Lessons Learned: Focus on a limited number of interventions can help rapidly expand services
Next Steps: Consolidate political and budgetary commitment

Program Element:

3. Family Nutrition Improvement, 1974 {a}

A.I.D. Support: Sustained, focused support, especially for family planning (21 years) and immunization (10 years)
Progress: High levels of use of rehydration therapy (43% rate of usage in 10 province survey)
Impact: Local area data on mortality reduction due to diarrheal disease and immunization programs and on improved nutritional status associated with nutritional education.

Lessons Learned: Integration of services needs to follow focused interventions.
Next Steps: Increase demand for child survival at all levels.

Expand EPI and diarrheal disease control programs, especially measles and tetanus immunization.

Program Element:

4. Family Planning, 1970 {a}

A.I.D. Support: Donor cooperation (48 percent)
Progress: High levels of contraception use (48 percent)
Impact: 35-40 % decline in child mortality, 45-50% decline in infant mortality due to comb. of factors, including increased availability of health services.

Lessons Learned: Expanding outside of
Next Steps: Increase participation of
Impact: One-time achievement

health system to private sector and of quantitative
community is key to quality of programs. targets does not
resource development. represent
sustainability.

5. Maternal Health

A.I.D. Support: Progress: Estimated
Complementary invest- 30 percent coverage by
ments in human resource Vitamin A capsule
development. distribution.

Declines in levels of
malnutrition.

Lessons Learned: Next challenge: Maternal/
Child survival perinatal health.
programs can help build
a primary health care Acute respiratory
system - even during infections.
periods of economic
retrenchment. Planning for the
diseases of the
epidemiologic
transition.

transition

{a} Date national program was established.

Table A-2. A.I.D.'s Support for Indonesia Child Survival Program,
1979-1989

Activity	Bilateral	Central Funds and Buy-Ins
----------	-----------	------------------------------

Immunization	Expanded Program of Immunization tance, commodities, and training to accelerate and strengthen national immunization capacity.	UNICEF. Grant for and other private support of immuni- zation.
--------------	---	---

	REACH. Technical assist. for tetanus toxoid and CHIPPS. Studies and acceleration of tetanus toxoid vaccination in three provinces.	urban immuni- zation strategies.
--	---	-------------------------------------

	PATH. Testing and introduction of new immunization technologies.	
--	---	--

PVO & PL-480: Title I (FY 1987)
One-time supplement for

vaccine purchase.

Control of Diarrheal Disease	Health Training Research and Development (FYs 1978-1989 Project Amendment). Buy-ins to develop a diarrheal disease control program. Pilot activities in three provinces.	PRITECH. Technical assistance in planning and medical school and curriculae development.	
		HEALTHCOM. Long-term adviser in social marketing and communications.	
		ADDR. Studies on treatment and prevention of diarrhea.	
Nutrition	Village Family Planning/Mother-Child Welfare (FYs 1980-1990). Activities to promote integration of nutrition with family planning activities.	Improvement of Maternal and Infant Diet Nutrition education and weaning practices.	Helen Keller International. Vitamin A distribution.
	PVO & PL480: Helen Keller International Vitamin A distribution.	CSAP. Supports study of Vitamin A impact on morbidity.	
Family Planning	Multiple. A.I.D. has been a major donor since program's inception. A.I.D. now provides only 5 percent of BKKBN budget, primarily to reduce fertility rate to promote small, healthy families.	Multiple.	
Service Delivery and Systems Development	CHIPPS (FYs 1981-1989). Strengthening provincial-level capacity. infection and	PRICOR. Studies acute respiratory support for the Child Survival Center.	Save the Children. Integrated services urban Jakarta.
	Studies of posyandus. Strengthening epidemiological capacity.	Technical Advisers for Child Survival. Supports immunization and other programs.	CARE. Child survival in 3 provinces.
	Facilities of Public Health Project (FYs 1986-1991).	Project Concern Demographic and	International.

Health Sector Financing (FYs 1988-1995). Technical assistance, studies, and other activities to improve allocation of public resources and to address financial aspects of sustaining child survival programs.

Health Surveys. Indonesian Contraceptive Prevalence Survey 1987.

American Medical Association.

PATH.

PVO & PL480: Save The Children. Integrated services urban Jakarta.

Indonesian Medical Association.

Promotion of child survival activities among private physicians.

CARE. Child survival in three provinces.

Project Concern International.

ADRA

PATH

{a} Not all projects can be classified in a single category. They have been placed in the category(ies) in which they most closely fit.

Note: See Glossary for definitions of acronyms.

Table A-3. Leading Causes of Infant Deaths in Indonesia -- Household Health Surveys, 1980 and 1986 (percent)

1980	1986
Pneumonia 21.7	Tetanus 19.3
Tetanus 20.2	Perinatal 18.4
Diarrheal disease 16.6	Diarrheal disease 15.6
Meningitis 7.5	Acute respiratory infection 14.4
Birth injuries 6.2	Measles 7.5
Obscure symptoms 5.1	Nervous system 5.6
Dysentery 4.7	Congenital 4.2
Other perinatal 2.8	Diphtheria, pertussis 1.0
Cholera 2.0	Anemia, malnutrition 1.0
Other infections 13.2	Other 13.0
1986 (Reanalyzed)	
Perinatal 26.0	
Acute respiratory infection 23.0	
Tetanus 13.6	
Diarrheal disease 12.8	
Measles 5.2	
Meningitis 5.2	
Preventable injuries 1.4	
Nonpreventable injuries 1.4	

Nutritional disorder	1.8
Other	9.6

Sources: 1980: Utomo and Iskandar, 1986.
 1986: Government of Indonesia-UNICEF, 1988.
 1986: Reanalysis: Unpublished table by Michael Linnen for
 USAID/Jakarta

Figure A-1. USAID/Indonesia Health/Family Planning Portfolio: Transition From
 1984-1988 CDSS to 1989-1993 CDSS

GLOSSARY

ADDR	- Applied Diarrheal Disease Research project
ADRA	- Adventist Development Relief Agency
A.I.D.	- United States Agency for International Development
ARI	- acute respiratory infection
ASEAN	- Association of South Asian Nations
BKKBN	- National Family Planning Coordination Board
CDD	- Control of Diarrheal Diseases
CDSS	- Country Development Strategy Statement
CHIPPS	- Comprehensive Health Improvement Project -- Province Specific
CMR	- child mortality rate
CPR	- contraceptive prevalence rate
CSAP	- Child Survival Action Program
CSS	- Child Survival Services
DPT	- diphtheria, pertussis, and tetanus (vaccine)
EPI	- Expanded Program on Immunization
Healthcom	- Communication for Child Survival project
Healthtech	- Technologies for Child Health
kader	- village health volunteer
MSG	- monosodium glutamate
PATH	- Program for Appropriate Technology in Health

posyandu	- community-supported integrated health post
PRICOR	- Primary Health Care Operation Research project
PRITECH	- Technologies for Primary Health Care project
PVO	- private voluntary organization
REACH	- Resources for Child Health project
UNICEF	- United Nations Children's Fund
WHO	- World Health Organization

BIBLIOGRAPHY

- Arnold, Richard. 1987. "Indonesia: Assistance to Aceh Province in Neonatal Tetanus Mortality Survey." Unpublished paper.
- Bair, William D., Ida Bagus Astawa, Kemal Nazaruddin, and Diddy Sudarmadi. 1987. "Evaluation of Village Family Planning Program." USAID/Indonesia.
- Budiarsana-Iskandar, Meiwita. 1988. "Missed Opportunities: Study of Non-Vaccination in Indonesia." Draft working paper.
- Cornia, Giovanni A., Richard Jolly, and Frances Stewart. 1989. *Adjustment With a Human Face*. New York: Oxford University Press.
- Government of Indonesia. 1984. *REPELITA IV 1984/1985 1988/1989: Policies and Prospects for Sustained Development Under Challenging Conditions*. Jakarta, Indonesia: National Development Planning Agency, Republic of Indonesia.
- Government of Indonesia. 1987. *National Health Expenditure Review Fiscal Year 1982/1983-1986/1987*. Jakarta, Indonesia: Bureau for Planning, Ministry of Health.
- Government of Indonesia. 1988. *Social Marketing Plan for Diarrhea Disease Control West Java Province, January 1988-September 1989*. Bandung, Indonesia: West Java Health Department.
- Government of Indonesia. 1989a. *An Inventory of Health Economics Studies in Indonesia*. Jakarta, Indonesia: Ministry of Health.
- Government of Indonesia. 1989b. *National Indonesia Contraceptive Prevalence Survey 1987*. Jakarta, Indonesia: Central Bureau of Statistics and National Family Planning Coordinating Board. Columbia, Maryland: Institute for Resource Development/Westinghouse.

- Government of Indonesia. 1989c. The Community Health Care Fund in Indonesia. Jakarta, Indonesia: Ministry of Health.
- Government of Indonesia. N.d. REPELITA V (1989/1990-1993/1994). Jakarta, Indonesia: National Development Planning Agency.
- Government of Indonesia-UNICEF. 1988. "Situation Analysis of Children and Women in Indonesia." Jakarta, Indonesia.
- Gupta, Dinesh K. 1988. Expanded Program on Immunization Information System -- EPIIS Assistance to WHO/SEARO.
- Harbinson, Sarah, Sri Djuarini, and Dewa Nyoman Wirawan. 1988. "Mid-Term Evaluation of USAID Project No. 497-0327." Family Planning Development and Services (FPDS) II Research Component. USAID/Indonesia.
- Jones, Warren, and Bill Emmet. 1989. "Child Survival Activities, Republic of Indonesia: A Review of Current Issues Relating to EPI and CDD Activities." Unpublished paper.
- Jones, Warren, and Michael Linnan. 1989. "Expanded Program on Immunization (EPI) Development of Child Survival Activities: A Review of Five Major Elements of the National EPI Program and Planned Child Survival for 1990-1995." Unpublished paper.
- Judd, Mary. 1987. "Village Kader Study: An Investigation of Kaders in Five West Java Villages." Unpublished paper.
- Louis, Terry. 1989. "The Development of Counseling Cards for Community Health Workers as an Aid to Teaching Mothers Proper Diarrheal Case Management in West Java, Indonesia." Unpublished paper.
- Ministry of Health. 1989. "Pemantauan Program Imunisasi Tuhun 1988/1989." Jakarta, Indonesia: Government of Indonesia.
- National Family Planning Coordinating Board, The Universities of Udayana, Brawijaya, and Airlangga, and Community Systems Foundation in the United States. 1986. KB-GIZI An Indonesian Integrated Family Planning, Nutrition, and Health Program: The Evaluation of the First Five Years of Program Implementation in East Java and Bali. Ann Arbor, Michigan: Community Systems Foundation.
- Pratt, Robert, R. Soebekti, Priyono Ashari, A.M. Meliala, Soekardjono, and Mary White. 1987. "Evaluation of the Comprehensive Health Improvement Program-Province Specific. USAID/Indonesia." Unpublished report.
- Rifken, Susan B., and Gill Walt. 1986. "Why Health Improves: Defining the Issues Concerning 'Comprehensive Primary Health Care' and 'Selective Primary Health Care.'" Soc. Sci. Med. 23 (6):559-566.

- Roestam, Kardinah S. 1988/1989. Family Welfare Movement (PKK) in Indonesia and Its Achievement. Diperbanyak oleh, Indonesia: Tim Penggerak PKK Pusat.
- Solter, Steven L., Ali Azir Hasibuan, and Burhanuddin Yusuf. 1986 "An Epidemiological Approach to Health Planning and Problem-Solving in Indonesia." Health Policy and Planning. 1(1).
- Thomson, James F. 1982. "Water Supply and Sanitation and Diarrheal Disease Control in the Comprehensive Health Improvement Project -- Province Specific (CHIPPS) in Indonesia." Washington Field Report No. 42. USAID/Indonesia.
- Tulloch, J. 1988. "Report of a Visit to Indonesia." Geneva, Switzerland: CDD Programme, World Health Organization. Unpublished report.
- Utomo, Budi, and Meiwata B. Iskandar. 1986. Mortality Transition in Indonesia 1950-1980. Asian Population Studies Series. No 74. Bangkok, Thailand: United Nations.
- USAID/Indonesia. N.d. "Strategic Plan 1989-1994." Office of Population and Health, USAID/Indonesia. Photocopy.
- USAID/Indonesia. 1988. "Country Development Strategy Statement (CDSS) Indonesia (FY 1989-FY 1993)." Project Paper.
- Van Sant, Jerry, Benson Hausman, Sri Pamoedjo Rahardjo, John A. Ross, and Dennis N.W. Chao. 1985. An Evaluation of A.I.D.'s Role in Indonesian Family, 1980-1984. Jakarta, Indonesia. USAID/Indonesia.
- Wasisto, Broto, Ridwan Malik, P. Sudharto, Priono Ashari, and Oscar Gish. 1987. Health Care financing in Indonesia. Paper presented at ADB Regional Seminar on Health Care Financing, Manila, Philippines. Jakarta, Indonesia: Ministry of Health.
- World Bank. 1982. World Development Report. Washington, D.C.: World Bank.
- World Bank. 1983. World Development Report. Washington, D.C.: World Bank.
- World Bank. 1988. World Development Report. Washington, D.C.: World Bank.
- World Bank. 1989a. World Development Report. Washington, D.C.: World Bank.
- World Bank. 1989b. Indonesia Issues in Health Planning and Budgeting. Report No. 7291-IND. Washington, D.C.: World Bank.
- World Health Organization (WHO). 1982-1989. Annual Reports on EPI

Program.

World Health Organization (WHO). 1988. "Diarrheal Diseases Control Programme: Impact of Oral Rehydration Therapy on Hospital Admission and Case-Fatality Rates for Diarrheal Disease: Results From 11 Countries." *Wkly Epidem Rec.* 63 (February):49-56.

Yusuf, B., Z. Bakri, A. A. Hasibuan, E. R. Ayub, T. I. Soewarso, and R. B. Arnold. 1986. "Neonatal Tetanus Mortality in Aceh Province, Indonesia." *Ann. Soc. Belge Med. Trop.* (66):349-354.